CLAIMS

What is claimed is:

1. A dual contact ring for electroplating a metal on a substrate and removing the metal from a selected region on the substrate, comprising:

a first ring for contacting the substrate;

a negative voltage source electrically connected to said first ring for applying a negative voltage to said first ring;

a second ring for contacting the selected region on the substrate; and

a positive or ground contact voltage source electrically connected to said second ring for applying a positive voltage to said second ring.

2. The dual contact ring of claim 1 wherein said first ring comprises an inner voltage ring for contacting a central region on the substrate and said second ring comprises an outer voltage ring for contacting an outer region on the substrate.

3. The dual contact ring of claim 1 further comprising an isolation ring interposed between said first ring and said second ring.

4. The dual contact ring of claim 3 wherein said first ring comprises an inner voltage ring for contacting a central region on the substrate and said second ring comprises an outer voltage ring for contacting an outer region on the substrate.

5. The dual contact ring of claim 3 wherein said isolation ring comprises asbestos.

6. The dual contact ring of claim 5 wherein said first ring comprises an inner voltage ring for contacting a central region on the substrate and said second ring comprises an outer voltage ring for contacting an outer region on the substrate.

7. The dual contact ring of claim 3 wherein said isolation ring has a width of about 3-5 mm.

8. The dual contact ring of claim 7 wherein said first ring comprises an inner voltage ring for contacting a central region on the substrate and said second ring comprises an outer voltage ring for contacting an outer region on the substrate.

9. A method of electroplating a metal on a substrate and removing the metal from a selected region on the substrate, comprising the steps of:

providing a first ring in contact with the substrate;

providing a second ring in contact with the selected region on the substrate;

electroplating the metal onto the substrate by applying a negative voltage to the substrate through said first ring; and

removing the metal from the selected region on the substrate by applying a positive voltage or ground contact to the selected region on the substrate through said second ring.

10. The method of claim 9 wherein said first ring comprises an inner voltage ring for contacting a central region on the substrate and said second ring comprises an outer voltage ring for contacting an outer region on the substrate.

11. The method of claim 9 wherein said positive voltage is from about 10 volts to about 20 volts and said negative voltage is from about -10 to about -20 volts.

12. The method of claim 11 wherein said first ring comprises an inner voltage ring for contacting a central region on the substrate and said second ring comprises an outer voltage ring for contacting an outer region on the substrate.

13. The method of claim 9 wherein said applying a negative voltage to the substrate through said first ring comprises the step of applying said negative voltage to the substrate through said first ring for a period of from about 2 minutes to about 8 minutes.

14. The method of claim 13 wherein said first ring comprises an inner voltage ring for contacting a central region on the substrate and said second ring comprises an outer voltage ring for contacting an outer region on the substrate.

15. The method of claim 13 is from about 10 volts to about 20 volts and said negative voltage is from about -10 volts to about -20 volts.

16. The method of claim 9 wherein said applying a positive voltage to the selected region on the substrate through said second ring comprises the step of applying said positive voltage to the selected region on the substrate through said second ring for a period of from about 5 minutes to about 10 minutes.

17. The method of claim 16 wherein said first ring comprises an inner voltage ring for contacting a central region on the substrate and said second ring comprises an outer voltage ring for contacting an outer region on the substrate.

18. The method of claim 16 wherein said positive voltage is from about 10 volts to about 20 volts and said negative voltage is from about -10 to about -20 volts.

19. A method of electroplating a metal on a substrate and removing the metal from a selected region on the substrate, comprising the steps of:

providing a first ring in contact with the substrate;

providing a second ring in contact with the selected region on the substrate;

providing an isolation ring between said first ring and said second ring;

electroplating the metal onto the substrate by applying a negative voltage to the substrate through said first ring; and

removing the metal from the selected region on the substrate by applying a positive voltage to the selected region on the substrate through said second ring.

20. The method of claim 19 wherein said first ring comprises an inner voltage ring for contacting a central region on the substrate and said second ring comprises an outer voltage ring for contacting an outer region on the substrate.